The California Energy Commission and the U.S. Department of Energy, Office of Industrial Technologies BestPractices present:

ENERGY SOLUTIONS FOR CALIFORNIA INDUSTRY:

WAYS TO IMPROVE OPERATIONS AND PROFITABILITY

AUGUST 2001

CASE STUDY

BENEFITS

- Improves operating income by $76,500 annually
- Reduces natural gas and water purchases
- Reduces maintenance costs
- Improves production
- Reduces labor costs

APPLICATIONS

Process heating applications can consume significant amounts of energy in industrial facilities. Appropriate heat exchange systems can reduce energy consumption and increase operational efficiency.

ABOUT THIS EVENT

The purpose of the Energy Solutions for California events is to provide a *professional, solutions-oriented* environment for industrial electricity users who face serious challenges to remaining operational and profitable during the current energy crisis. Industrial electricity users have the opportunity to receive unbiased information and analytical tools that can increase reliability and manage short and long-term production costs.

Heat Exchange System Improvement Saves Energy and Improves Production at a Winery

Summary

In 2000, Fetzer Vineyards implemented a project to improve its process heating cycle at its Hopland Winery in Hopland, California. In an effort to reduce expenditures on natural gas, Fetzer reviewed their wine process heating cycle and discovered that they could reduce their natural gas purchases and improve efficiency by installing a heat exchanger. The project enabled the winery to reduce its annual natural gas consumption by over 700 million BTU and its water consumption by 1,000,000 gallons, leading to energy savings of $16,500. The project also increased the productivity of the bottling lines by 20%, and led to less material waste. Annual labor, maintenance and materials savings were $60,000. Total annual savings were $76,500, and since the project cost was $75,000, the simple payback was just under 1 year.

Background

Established in 1968, Fetzer Vineyards began as a family farm and has grown to become the sixth largest premium wine producer in the U.S. Fetzer produces four lines of varietal wines, which are marketed

Fetzer Vineyards

throughout the world. Since its inception, Fetzer has been proactive towards energy conservation and environmentally friendly production, including organic grape growing. In the early 1990s, Fetzer expanded rapidly, leading to the establishment of a new winery in Paso Robles, California.

The Hopland winery is Fetzer's main production site, with 7.7 million gallons of steel storage capacity, seven grape crushers, and an annual fermentation capacity of 35,000 tons. The site also includes separate temperature controlled areas for fermentation, a bottling operation, and a 600,000 case storage center.

Project Overview

White wines such as Riesling, Gewürztraminer and White Zinfandel are produced at very cold temperatures (28° Fahrenheit). If the wine is bottled at this temperature, condensation forms on the outside of the bottle, causing the labels to come off or move out of place. Warming the wine to between 50° and 54° Fahrenheit prior to bottling solves the labeling problem. Prior to the project, the wine was warmed by running hot water down the sides of the wine tank. The water was heated by a boiler and after warming the tank, exited out the wastewater system. This method was unsatisfactory because it was time-consuming, did not warm the wine in the tank at an even temperature, used a lot of water, and put the staff at frequent risk of hot water burns.

The winery staff researched different ways of heating the wine. After careful review, they concluded the best solution would be to install a heat exchanger in the pre-bottling area. The heat exchanger could more efficiently warm the wine to the required temperature, reduce water consumption, and lower maintenance costs.

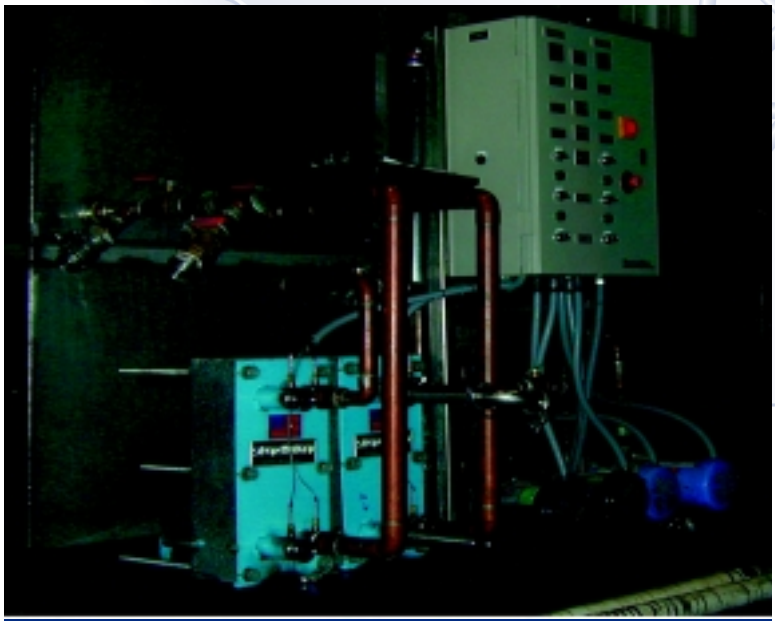
Project Implementation

The winery implemented the project by purchasing a high efficiency heat exchanger and installing it between the wine production area and the pre-bottling area. Installing it between these two areas was advantageous because it did not require modification of the existing facilities to accommodate the heat exchanger. As the wine passed through pipes en route to pre-bottling, it came into contact with the heat exchanger.

Another feature that made the new heat exchanger system attractive to the winery was that it was a recirculating system. The existing system would allow water to pass along the sides of the wine tank only once before sending it into the wastewater system. The new system is able to circulate the water over the pipes several times before sending it to the wastewater system.

Results

Once the project was completed, Fetzer's Hopland winery experienced savings in natural gas and water expenses, as well as increased production. Prior to the project, the winery spent almost $8,000 per year on natural gas to run the boiler that heats the 200 tanks of cold white wine it produces annually. With the new heat exchanger system, it costs the winery just under $2,500 in yearly natural gas purchases, resulting in $5,500 and 700 million BTU savings in natural gas. The recirculating of hot water by the new system reduced the amount of water that had to be pumped, treated and disposed of and led to savings of over 1,000,000 gallons and $11,000. Passing the wine through the heat exchanger prevents condensation and allows the bottling lines to run 20% faster. It also reduced the amount of rework that was being done on the labeling. As a result, the bottling plant requires 47 fewer shifts to produce the same amount of wine, resulting in labor savings of $48,000. Because the amount of rework has been reduced, fewer labels are being wasted, leading to materials savings of $11,000 per year. In addition, reduced boiler use has led to maintenance savings of $1,500 per year. The total savings from the project are $76,500, and since the implementation cost was $75,000, the simple payback is slightly less than 1 year.



Heat Exchanger

California Energy Commission and U.S. Department of Energy present

ENERGY SOLUTIONS FOR CALIFORNIA INDUSTRY: Ways to Improve Operations and Profitability

Lessons Learned

Process heating in industrial settings requires appropriate equipment in order to be efficient. As plants expand production, methods of process heating that may have been satisfactory when production was on a smaller scale lose their effectiveness and can lead to excessive energy costs and inconsistent product quality. By installing a heat exchanger, Fetzer's Hopland winery was able to save energy and improve the effectiveness of its wine heating process, leading to better productivity. In addition, it reduced the winery's dependence on other systems and created a safer work environment.

PROJECT PARTNERS

- **Fetzer Vineyards**
  Hopland, California

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United States Department of Energy's Office of Industrial Technologies BestPractices

BestPractices is part of the OIT's Industries of the Future strategy, which helps the country's most energy-intensive industries improve their competitiveness. BestPractices brings together the best-available and emerging technologies and practices to help companies begin improving energy efficiency, environmental performance, and productivity right now.

California Energy Commission

The California Energy Commission is the state's primary energy policy and planning agency. It is the California Energy Commission's mission to assess, advocate, and act through public/private partnerships to improve energy systems that promote a strong economy and a healthy environment.